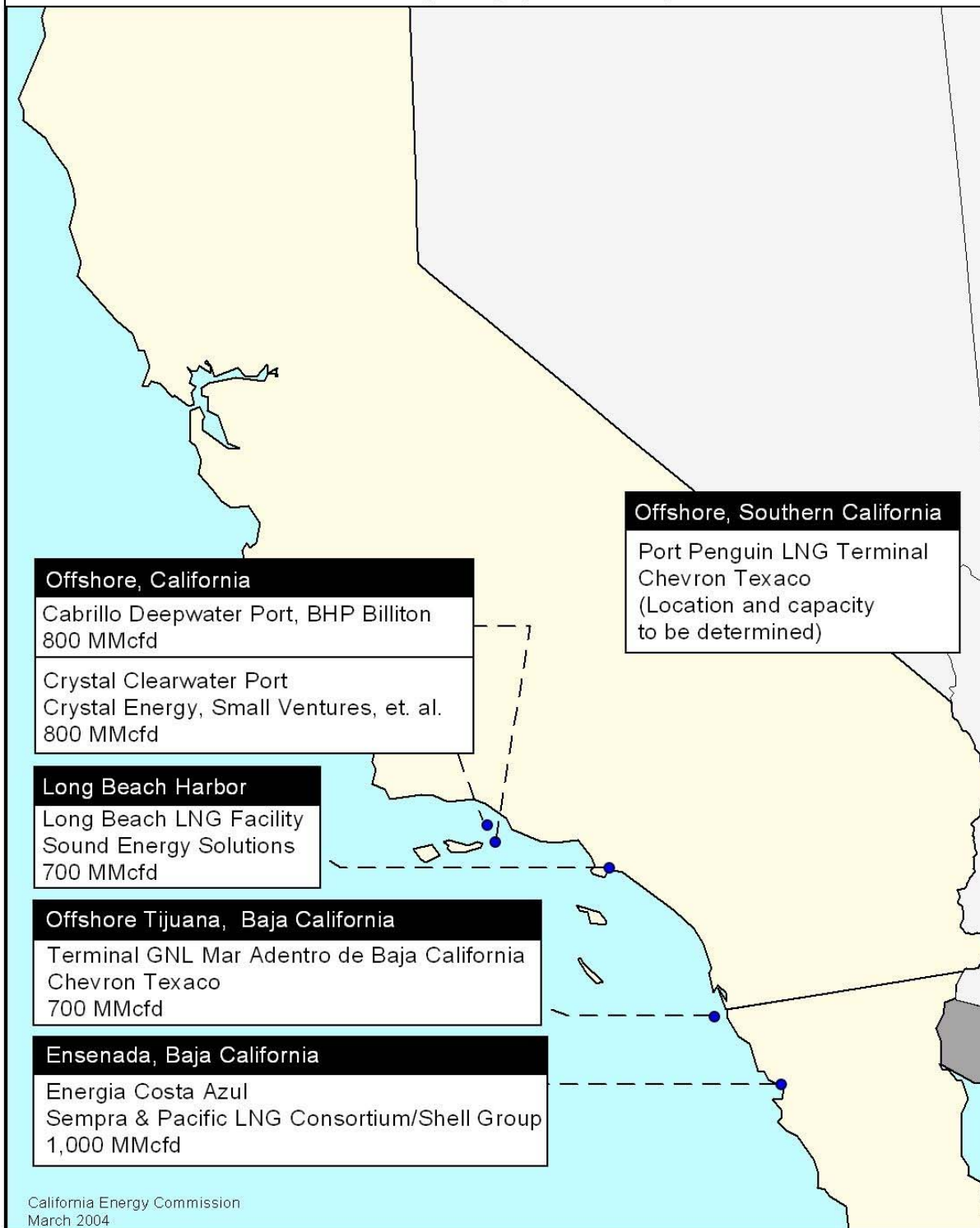


# WEST COAST LNG PROJECTS



## Proposed and Announced West Coast LNG Terminals and Capacity (in MMcfd)



# **Proposed West Coast LNG Projects**

## **BRITISH COLUMBIA, CANADA:**

### **1. Ridley Island LNG Terminal Project**

- The project owner is WestPac Terminals Inc.
- The project would be located at Ridley Terminals on Ridley Island in Prince Rupert, British Columbia.
- The project will use Ridley Terminals existing dock facilities.
- Possible LNG sources include Indonesia, Middle East and/or Australia.
- WestPac signed an agreement with Ridley Terminals and the Port of Prince Rupert on 7/5/04.
- The projected on-line date is 2009.

Sources of information: "Driving the Natural Gas Development in Prince Rupert", Prince Rupert Daily News, July 5, 2004.

### **2. Kitimat LNG Terminal Project**

- The project owner is Galveston Energy or Galveston LNG.
- The project would be located near Kitimat, British Columbia.
- Plans to build the LNG facility were announced in early May 2004.
- The project's estimated cost is approximately \$300 million.

Sources of information: "Driving the Natural Gas Development in Prince Rupert", Prince Rupert Daily News, July 5, 2004; "LNG About to be Imported, Not Exported", Vancouver Sun, D07, May 12, 2004.

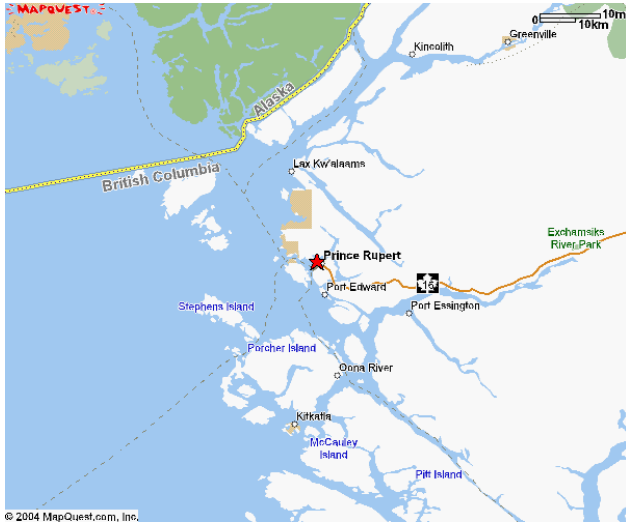
## **OREGON**

### **3. St. Helens LNG Terminal Project**

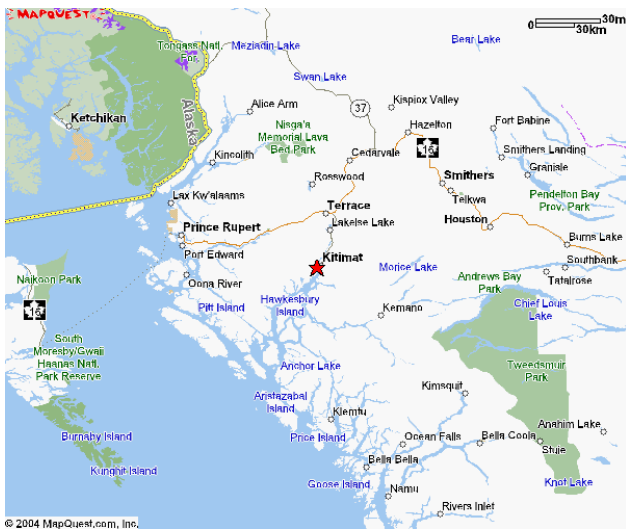
- The project owner is Port Westward LNG LLC (formerly Cherry Point Energy LLC)
- The project would be adjacent to the Port of St. Helens along the Columbia River in Oregon.
- The project would be near an existing power plant as well as two other permitted power plants and a proposed ethanol processing plant. A pipeline would be built to connect the terminal with the Williams Northwest Pipeline.
- Possible LNG providers could include Australia, Indonesia, Malaysia, and/or Russia.
- Port Westward LNG LLC is currently negotiating the land purchase.
- The facility would have an average send out capacity of 700 MMcfd and a peak capacity of 1,250 MMcfd.
- The project expected to cost between \$300-400 million.

Sources of Information: "Company in Talks to Acquire Land for LNG Terminal in Oregon", CyberTech Inc, Energy Central Professional®, July 7, 2004 (Clearing Up).

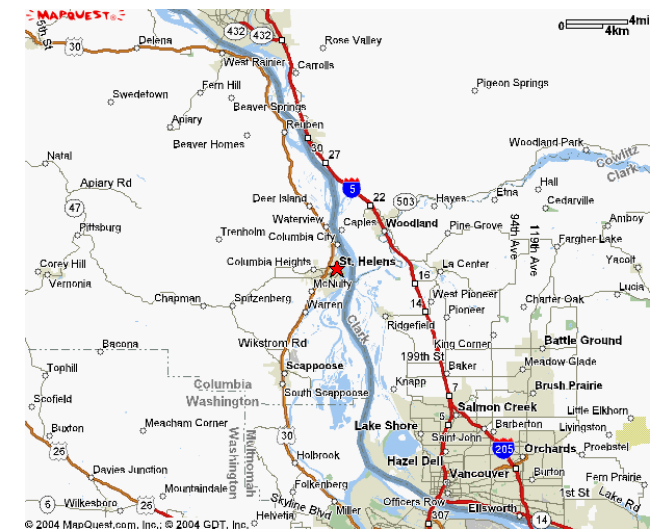
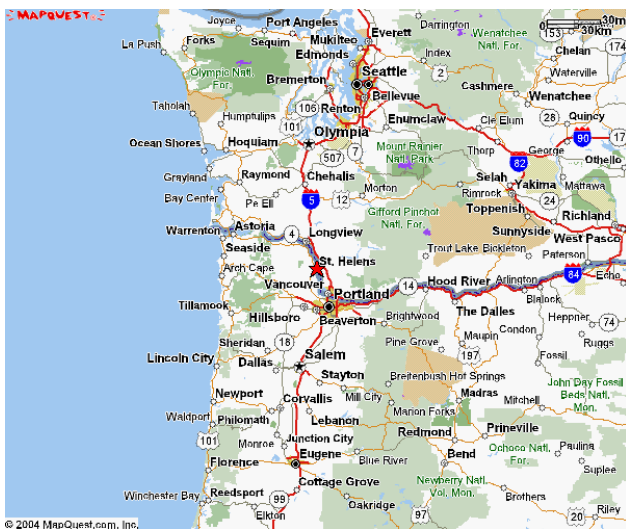
## Ridley Island (Port of Prince Rupert), British Columbia



## Kitimat, British Columbia



## St. Helens, Oregon



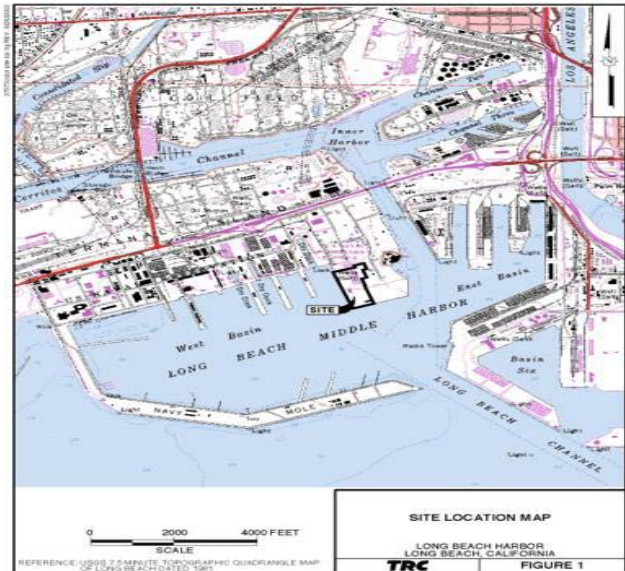
# Long Beach LNG Import Terminal

**Southern California Location:** The Long Beach LNG Facility project would be located on Pier T, Berth 126, on Terminal Island in the Port of Long Beach, Los Angeles County. It would occupy approximately 27 acres.

**Owner/Website:** California LNG Project Corporation dba Sound Energy Solutions (SES), a subsidiary of Mitsubishi Corporation;  
<http://www.soundenergysolutions.com>

**Project Manager:** Thomas E. Giles,  
(562) 495-9875, [thomasegiles@earthlink.com](mailto:thomasegiles@earthlink.com)

**Description:** This import facility would include an LNG carrier berth, two full-containment storage tanks, shell and tube vaporizers, metering and odorizing facilities, equipment for recovering and storing natural gas liquids, LNG vehicle fuel truck-loading facility, and a new 2.3-mile natural gas pipeline connecting to an existing Southern California Gas Company (SoCal Gas) pipeline.



**Average Natural Gas Production Capacity:** 700 MMcfd

**Peak Natural Gas Production Capacity:** 1,000 MMcfd

**LNG Storage Capacity:** 320,000m<sup>3</sup> (two tanks)

**Tentative LNG Sources\*:** Australia, Malaysia, and Alaska

**Possible Markets:** Southern California non-core customers, including electricity generators; municipal and investor-owned utilities, and, LNG vehicle fleets

**Approximate Project Cost:** \$400 million

**Status:** Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) is being prepared. A site visit and technical conference were held in Long Beach on 07/13/04.

**Siting Process:** SES participated in FERC's ([www.ferc.gov](http://www.ferc.gov)) prefiling process during which FERC and the Port of Long Beach ([www.polb.com](http://www.polb.com)) filed a Notice of Intent/Notice of Preparation of a Draft EIS/EIR on 9/22/03 followed by a supplemental notice on 11/10/03. The SES application to FERC was accepted on 1/26/04. A joint EIS/EIR will be prepared with FERC as NEPA lead agency and Port of Long Beach as CEQA lead agency for the LNG terminal. The Public Utilities Commission has asserted jurisdiction, requiring terminal developers to apply for a Certificate of Public Convenience and Necessity. The POLB and California Coastal Commission will evaluate the project's consistency with the Port Master Plan, the California Coastal Act, and federal Coastal Zone Management Plan. Amendment to the Port Master Plan must precede Port of Long Beach approval of a site lease.

**Projected On-Line Date:** 2008; SES would need four years to complete construction from date of FERC approval.

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\* Sources of LNG are tentative until the final contract is signed.

# Cabrillo Deepwater Port LNG Facility



**Southern California Location:** The Cabrillo Deepwater Port LNG Facility project would be located approximately 14 miles from shore, 21 miles from Anacapa Island and 18 miles from the boundary of Channel Island Marine Sanctuary off the coast of Ventura County.

**Owner/Website:** BHP Billiton,  
<http://lngsolutions.bhpbilliton.com/overview.asp>

**Project Manager:**  
Steven R. Meheen, (805) 604-2790,  
[Steven.R.Meheen@BHPBilliton.com](mailto:Steven.R.Meheen@BHPBilliton.com)

**Description:** This import facility (floating storage & regasification unit, FSRU) would be permanently moored offshore. The maximum water depth at the mooring would be about 2,900 feet. This facility would include three independent Moss spherical storage tanks

mounted within the hull, accommodations for personnel, ship berthing and mooring system, and eight vaporizers for regasification. At the mooring point, three 14" flexible mooring riser pipes and a pipeline end manifold on the sea floor would connect to a new underwater, 21.1-mile, 30" pipeline. This pipeline would be buried as it approaches shore north of the Ormond Beach Generating Station in Ventura County and would connect to a Southern California Gas Company (SoCal Gas) pipeline. No extensive onshore facilities would be constructed for this project. The FSRU would be approximately 14 miles offshore and would only be visible from elevated locations.

**Average Natural Gas Production Capacity:** 800 MMcfd

**Peak Natural Gas Production Capacity:** 1,500 MMcfd

**LNG Storage Capacity:** 273,000m<sup>3</sup> (three tanks)

**Tentative LNG Sources\*:** Australia

**Possible Markets:** Distribution throughout the Southern California Region

**Approximate Project Cost:** \$550 million

**Status:** The US Coast Guard (USCG, <http://www.uscg.mil/USCG.shtm>) accepted BHP Billiton's application as complete on 1/27/04 but its application with the State Lands Commission (SLC, [www.slc.ca.gov](http://www.slc.ca.gov)) has not been deemed complete by that state agency, which is however processing the application. The USCG and SLC have developed a website for this project at [www.cabrilloport.ene.com](http://www.cabrilloport.ene.com). Both federal and state agencies filed a Notice of Intent/Notice of Preparation of a Draft EIS/EIR on 2/24/04. Public scoping meetings were held in Oxnard and Malibu the week of 3/15/04. Public scoping meetings were held 03/15-16/04. Scoping Summary posted on 05/25/04. The USCG/MARAD clock was stopped on April 16<sup>th</sup> due to data gaps and EPA permitting issues.

**Siting Process:** A joint EIS/EIR will be prepared with the USCG as NEPA lead agency and the SLC as CEQA lead agency. Other permitting state agencies include the California Coastal Commission which must evaluate the projects consistency with the federal Coastal Zone Management Act. The Governor has the authority to approve or veto the proposed project. Local permitting agencies include City of Oxnard, County of Ventura, and the Ventura County Air Pollution Control District. Under the Deepwater Port Act, the USCG has less than one year to evaluate and reach a decision about project acceptability.

**Projected On-Line Date:** 2008

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\*Sources of LNG are tentative until the final contract is signed.

Sources of information: LNG Solutions/BHP Billiton website; USCG Docket# 16877; Ecology & Environment Cabrillo Port website; California State Lands Commission website.



# Crystal Clearwater Port

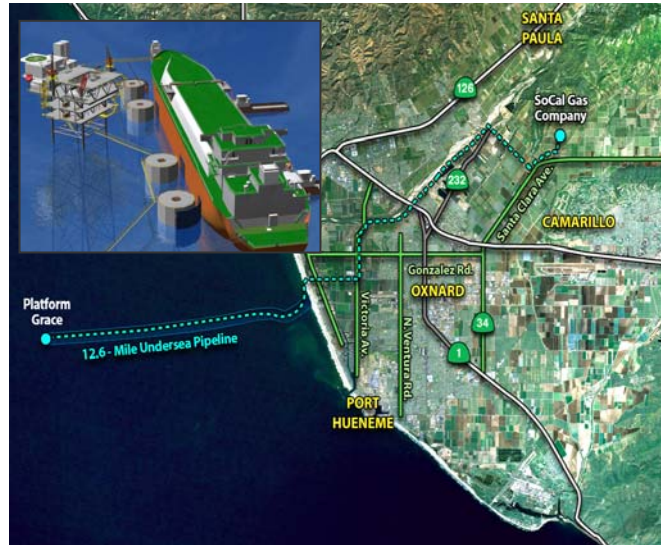
**Southern California Location:** The Crystal Clearwater Port Project would be located approximately 12.6 miles offshore of the City of Oxnard, Ventura County in the Santa Barbara Channel.

**Owner/Website:** Crystal Energy LLC;  
<http://www.crystalenergyllc.com>

**Project Contacts:**

Simon Poulter, Environmental Manager  
[spoulter@padreinc.com](mailto:spoulter@padreinc.com), (805) 683-1233;  
Lisa Palmer, Spokesperson  
[lisapalmer@crystalenergyllc.com](mailto:lisapalmer@crystalenergyllc.com) (805) 680-2336

**Description:** Clearwater Port would use existing offshore Platform Grace to import liquefied natural gas (LNG). Reconfiguration of the platform would involve installing an LNG transfer system, a cool down system, six LNG pumps, six LNG vaporizers, and reinstalling and upgrading the platform's power-production capability. LNG would be transported by ship to Platform Grace, where it would be converted back into vapor form. A new SPP floating dock would be installed adjacent to the platform to safely moor LNG vessels during transfer. No additional on-site storage is expected, but if required, Crystal Energy would contract with existing onshore storage facilities.



The natural gas would be delivered from the platform to shore in a new, 13-mile, 32" subsea pipeline, using an existing pipeline corridor to minimize disturbance to the marine environment. The natural gas would come onshore by pipeline to a landing at an existing industrial site, the Mandalay Power Generating Station in Oxnard. From the landfall at Mandalay, a new 12-mile underground pipeline would tie into an existing 30" Southern California Gas Company pipeline at their preferred pipeline tie-in point near Camarillo.

**Average Natural Gas Production Capacity:** 800 MMcfd

**Peak Natural Gas Production Capacity:** 1,200 MMcfd

**Tentative LNG Sources\*:** Alaska, Southeast Asia, and Australia

**Possible Markets:** Southern California

**Approximate Project Cost:** \$300 million

**Status:** Crystal Energy filed its application with the United States Coast Guard (USCG, <http://www.uscg.mil/USCG.shtm>) on 1/28/04 and with the State Lands Commission (SLC, [www.slc.ca.gov](http://www.slc.ca.gov)) on 2/10/04. The application is being reviewed by these agencies for completeness. The application was re-filed with USCG on 7/27/04 and with SLC on 7/29/04 and is still under review.

**Siting Process:** Once the application is deemed complete and accepted, a joint EIS/EIR will be prepared by with the USCG, as NEPA lead agency, and by the SLC, as CEQA lead agency. Under the Deepwater Port Act, the USCG has less than one year to evaluate and reach a decision about project acceptability. The USCG will review vessel safety and mooring design. Other federal permitting agencies include the Mineral Management Service. The California Coastal Commission must evaluate the projects consistency with the federal Coastal Zone Management Act, as well as issue a Coastal Development Permit for portions of the project within State Waters. Local permitting agencies include City of Oxnard, County of Ventura, and the Ventura County Air Pollution Control District.

**Projected On-Line Date:** Early 2007

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\* Sources of LNG are tentative until the final contract is signed. However, Crystal has signed a Memorandum of Understanding (MOU) with the Alaska Gasline Port Authority (AGPA) to negotiate a LNG supply. Under the agreement, AGPA would supply up to eight hundred million cubic feet (800 MMcfd) of LNG per day. Sources of LNG are tentative until the final contract is signed.

# Energia Costa Azul LNG Facility

**Baja California, Mexico Location:** The Energia Costa Azul LNG Receiving Terminal project would be located about 14 miles north of Ensenada, on the Costa Azul plateau.

**Owner/Website:** This project is a 50/50 joint venture between Sempra Energy LNG Corporation and Shell International Gas Limited, <http://www.sempra.com/index.htm> and <http://www.shell.com/home/Framework?siteId=home>



**Project Manager:**

Dale Kelly-Cochrane, (619) 696-4654;  
[dkelly-cochrane@sempra-slns.com](mailto:dkelly-cochrane@sempra-slns.com)

**Description:** This project would include a land-based receiving facility and related port infrastructure. The project site has more than 400 acres of undeveloped land, remote from residential areas. There would be two full containment tanks, open rack seawater vaporizers, and a 42-mile 36" to 42" diameter spur pipeline connecting the terminal to the Bajanorte Pipeline.

**Average Natural Gas Production Capacity:**  
1,000 MMcfd

**Peak Natural Gas Production Capacity:**  
1,300 MMcfd

**LNG Storage Capacity:** 320,000m<sup>3</sup> (two tanks)

**Tentative LNG Sources\*:** Indonesia

**Expansion Capabilities:** Up to 2,000 MMcfd average with a peak of 2,600 MMcfd (additional permitting required). Site has space for two additional storage tanks.

**Possible Markets:** Western Mexico, Southern California and Southwestern U.S.

**Approximate Project Cost:** \$610 million (terminal only)

**Status:** The Energy Regulatory Commission of Mexico (CRE, [www.cre.gob.mx](http://www.cre.gob.mx)) permit and the City of Ensenada's land-use permit were issued in August, 2003. The Secretary of Environment and Natural Resources (SEMARNAT, [www.semarnat.gob.mx](http://www.semarnat.gob.mx)) environmental permit was issued in April, 2003. As stated in the Phase 1 Comments of Sempra Energy LNG Corp., released March 23, 2004, a temporary injunction that was placed on the project's environmental permit in November, 2003 has been lifted as of March, 2004; and all three of the project's major permits are in full force and effect. Legal issues are still being investigated.

**Siting Process:** On-shore LNG terminals must obtain three key permits or approvals from Mexican government agencies. The Energy Regulatory Commission (CRE) is responsible for regulating the siting, construction, operation, and ownership of LNG terminals in Mexico. Developers must obtain permission to import gas into Mexico and to build and operate an LNG receiving terminal from CRE. The developer must also prepare an environmental impact assessment and submit it to the Secretariat of Environment and Natural Resources (SEMARNAT). Based on that assessment, SEMARNAT issues an environmental impact authorization (EIA), including impact mitigation conditions. (It also requires LNG terminal developers to conduct a public safety risk study and issues a risk permit as well.) A land-use permit from the local municipality is the third key approval.

**Projected On-Line Date:** 2007

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\* Sources of LNG are tentative until the final contract is signed.

Sources of information: Sempra Energy website press releases; PRNewswire, December 22, 2003; San Diego Union-Tribune, December 19, 2003; Reuters, December 22, 2003; Phase 1 Comments of Sempra Energy LNG Corp. before the California Public Utilities Commission, March 23, 2004.



# Terminal GNL Mar Adentro De Baja California

**Baja California, Mexico Location:** The GNL Mar Adentro de Baja California project would be located eight miles off the coast of Tijuana. It would be approximately six miles off the coast of Playas and 600 meters east of South Coronado Island.

**Owner/Website:** ChevronTexaco;  
<http://www.chevrontexaco.com/gnlbaja/about/>

**Project Manager:** Steve Schwartz,  
(713) 752-6139

**Description:** This import facility would be a gravity-based structure (GBS) including all utility systems required to support operations. Water depth at the proposed site is 65 feet. The terminal would be a fixed 980-foot-long concrete island with two regasification plants, storage tanks, a heliport, and a dock for LNG carriers. At this offshore terminal, the LNG would be regasified using seawater. A new underwater pipeline would connect with Baja California's existing gas pipeline system.



**Average Natural Gas Production Capacity:** 700 MMcfd

**Peak Natural Gas Production Capacity:** 1,400 MMcfd

**LNG Storage Capacity:** 250,000m<sup>3</sup>

**Tentative LNG Sources\*:** Western Australia

**Possible Markets:** Northern Baja California and throughout the North American West Coast

**Approximate Project Cost:** \$650 million

**Status:** CRE accepted the offshore permit application in July, 2003. An offshore *manifestacion de impacto ambiental* and risk study was submitted October, 2003. SCT licensing is proceeding; a call for prequalification was issued on December 29, 2003. Legal issues are still being investigated.

**Siting Process:** Off-shore LNG terminals must obtain three key permits or approvals from Mexican government agencies. Developers must obtain a permit to build and operate an LNG receiving terminal from the Energy Regulatory Commission (CRE). The developer must also prepare an environmental impact assessment and a public safety risk study and submit them to the Secretariat of Environment and Natural Resources (SEMARNAT). Based on these assessments, SEMARNAT issues an environmental impact authorization (EIA), including impact mitigation conditions. Ministry of Communications and Transportations (SCT) must grant a concession to use federal waters and to construct the LNG terminal in federal waters. No land-use permit from the local municipality is required for an off-shore terminal, but a pipeline Right of Way is needed from the municipality of pipeline Landfall.

**Projected On-Line Date:** 2007

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\*Sources of LNG are tentative until the final contract is signed.

Sources of information: ChevronTexaco GNL Baja website; NGI's Daily Gas Price Index, October 31, 2003; PRNewswire, October 30, 2003; Reuters, October 30, 2003.

# Sonora Pacific LNG Terminal



**Gulf of California Location:** The Sonora Pacific LNG Terminal project would be located at Puerto Libertad on the Gulf of California in Northwestern Mexico. Puerto Libertad is a bay located approximately 416 km from Hermosillo in the State of Sonora.

**Owners/Website:** Sonora Pacific LNG, a subsidiary of Houston-based DKRW Energy LLC.

**Project Manager:** Unknown at this time.

**Description:** This import facility would include two storage tanks at Puerto Libertad, an intrastate pipeline in Sonora, and a 36-inch diameter export pipeline to interconnect with El Paso Natural Gas east of Tucson, AZ. 500 MMcfd would be used in Sonora with 800 MMcfd piped to the US.

**Average Natural Gas Production Capacity:** Unknown at this time.

**Peak Natural Gas Production Capacity:** 1,300 MMcfd

**LNG Storage Capacity:** 320,000m<sup>3</sup> (two tanks)

**Tentative LNG Sources\*:** Pacific Basin, Middle East

**Possible Markets:** Mexico, California, Arizona

**Approximate Project Cost:** Unknown

**Status:** As of 05/26/04, a cooperation agreement had been signed between Sonora Pacific LNG and the state of Sonora, Mexico. Federal permits in Mexico still need to be obtained.

**Siting Process:** On-shore LNG terminals must obtain three key permits or approvals from Mexican government agencies. The Energy Regulatory Commission (CRE) is responsible for regulating the siting, construction, operation, and ownership of LNG terminals in Mexico. Developers must obtain permission to import gas into Mexico and to build and operate an LNG receiving terminal from CRE. The developer must also prepare an environmental impact assessment and submit it to the Secretariat of Environment and Natural Resources (SEMARNAT). Based on that assessment, SEMARNAT issues an environmental impact authorization (EIA), including impact mitigation conditions. (It also requires LNG terminal developers to conduct a public safety risk study and issues a risk permit as well.) A land-use permit from the local municipality is the third key approval.

**Projected On-Line Date:** Mid-2008

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\*Sources of LNG are tentative until the final contract is signed.

Sources of information: NGI's Daily Gas Price Index, May 26, 2004; HoustonChronical.com, May 26, 2004.